

### REMARKS

Claims 1-44 are pending in the present Application, and all claims currently stand rejected. Accordingly, claims 1, 21, and 41-44 are amended herein. Reconsideration of the Application in view of the foregoing amendments and the following remarks is respectfully requested.

### 35 U.S.C. § 103

On page 2 of the Office Action, the Examiner rejects claims 1, 6, 9, 12, 21, 26, 29, 32, 41, 42, and 44 under 35 U.S.C. § 103(a) as being unpatentable over U.S. Patent No. 5,703,970 to Atashroo (hereafter Atashroo) in combination with U.S. Patent Publication No. US 2004-0028261 to Tufvesson (hereafter Tufvesson). The Applicants respectfully traverse these rejections for at least the following reasons.

Applicants maintain that the Examiner has failed to make a *prima facie* case of obviousness under 35 U.S.C. § 103(a) which requires that three basic criteria must be met, as set forth in M.P.E.P. §2142:

"First, there must be some suggestion or motivation, either in the references themselves or in the knowledge generally available to one of ordinary skill in the art, to modify the reference or to combine reference teachings. Second, there must be a reasonable expectation of success. Finally, the prior art reference (or references when combined) must teach or suggest all the claim limitations" (emphasis added).

The initial burden is therefore on the Examiner to establish a *prima facie* case of obviousness under 35 U.S.C. § 103(a).

Regarding the Examiner's rejection of independent claims 1, 21, 41, 42, and 44, Applicants respond to the Examiner's §103 rejections as if applied to amended independent claims 1, 21, 41, 42, and 44 which now recite "*said binarization procedure converting a non-binary number format into a binary number format,*" which are limitations that are not taught or suggested either by the cited references, or by the Examiner's citations thereto.

Atashroo teaches a basic technique for computing correlating images by utilizing a sequence of one-dimensional FFTs (see column 3, lines 24-63). However, Applicants submit that Atashroo nowhere teaches utilizing any type of "binarization procedure" in conjunction with the correlating images. In particular, Applicants submit that Atashroo fails to disclose utilizing a "binarization procedure" in conjunction with a "symmetrical reduction procedure," as claimed by Applicants. For at least these reasons, Applicants request reconsideration and withdrawal of the rejections of claims 1, 21, 41, 42, and 44.

On page 2 of the Office Action, the Examiner concedes that "Atashroo does not teach an image conversion procedure that includes a binarization procedure." Applicants concur. The Examiner then points to Tufvesson to purportedly remedy these deficiencies. Applicants respectfully traverse. In particular, the Examiner cites paragraph 20 of Tufvesson against Applicants claimed "binarization procedure." Paragraph 20 of Tufvesson states that "only a small

amount of memory is needed for the storage of the reference fingerprint if the recorded image is converted into an image without grey scale, that is an image which is binary” (emphasis added).

Applicants submit that the Examiner has misinterpreted the word “binary” as used in Tufvesson. Applicants submit that here, the word “binary” refers only to removing the grey-scale continuum to produce a simple two-state (binary) black-and-white image. Applicants submit that Tufvesson is not using the word “binary” to refer to digital binary numbers, as in the Applicants’ case.

Furthermore, Applicants submit that the original gray-scale image of Tufvesson is already encoded in a digital binary format, as can be seen by the comment that “only a small amount of memory is needed for the storage of the reference fingerprint if the recorded image is converted into an image without grey scale” (emphasis added). Digitally encoding the wider variety of shades in grey-scale images requires a larger number of binary bits, and would therefore require more memory. For at least the foregoing reasons, Applicants submit that Tufvesson fails to teach “*said binarization procedure converting a non-binary number format into a binary number format*,” as recited by Applicants.

With further regard to claim 42, “means-plus-function” language is utilized to recite elements and functionality similar to those recited in claims 1 and 21, as discussed above. Applicants therefore incorporate those remarks by reference with regard to claim 42. In addition, the Courts have frequently held that “means-plus-function” language, such as that of claim 42, should be construed in light of the Specification. More specifically, means-plus-function claim elements

should be *construed to cover the corresponding structure, material or acts described in the specification*, and equivalents thereof. Applicants respectfully submit that, in light of the substantial differences between the teachings of the cited references and Applicants' invention as disclosed in the Specification, claim 42 is therefore not anticipated or made obvious by the teachings of the cited references.

Regarding the Examiner's rejection of dependent claims 6, 9, 12, 26, 29, and 32, for at least the reasons that these claims are dependent from respective independent claims whose limitations are not identically taught or suggested, the limitations of these dependent claims, when viewed through or in combination with the limitations of the respective independent claims, are also not identically taught or suggested. Applicants therefore respectfully request reconsideration and allowance of dependent claims 6, 9, 12, 26, 29, and 32, so that these claims may issue in a timely manner.

With further regard to dependent claims 6, 9, 12, 26, 29, and 32, Applicants have herein amended each of these claims to recite "*a single Fast Fourier Transform procedure*" (emphasis added) to differentiate Applicants' claimed invention from the process described in Atashroo. As described above, Atashroo teaches utilizing a sequence of one-dimensional FFTs. In particular, Atashroo utilizes a "first step (FIG. 3(b)) in which a real one-dimensional N-point FFT is used . . . ." and then utilizes a "second step" in which "a one-dimensional M-point FFT is used . . ." (see column 4, lines 52-60). For at least these reasons,

Applicants submit that Atashroo fails to anticipate Applicants claims 6, 9, 12, 26, 29, and 32.

For at least the foregoing reasons, the Applicants submit that claims 1, 6, 9, 12, 21, 26, 29, 32, 41, 42, and 44 are not unpatentable under 35 U.S.C. § 103 over the cited references, and that the rejections under 35 U.S.C. § 103 are thus improper. The Applicants therefore respectfully request reconsideration and withdrawal of the rejections of claims 1, 6, 9, 12, 21, 26, 29, 32, 41, 42, and 44 under 35 U.S.C. § 103.

On page 6 of the Office Action, the Examiner rejects claims 2, 3, 22, and 23 under 35 U.S.C. § 103(a) as being unpatentable over Atashroo and Tufvesson in view of U.S. Patent Publication No. US 2004/0215615 A1 to Larsson et al. (hereafter Larsson). The Applicants respectfully traverse these rejections for at least the following reasons.

Applicants maintain that the Examiner has failed to make a *prima facie* case of obviousness under 35 U.S.C. § 103(a). As discussed above, for a valid *prima facie* case of obviousness under 35 U.S.C. § 103(a), the prior art references when combined must teach or suggest all the claim limitations." The initial burden is on the Examiner to establish a *prima facie* case of obviousness under 35 U.S.C. § 103(a).

Regarding the Examiner's rejection of dependent claims 2, 3, 22, and 23, for at least the reasons that these claims are dependent from respective independent claims whose limitations are not identically taught or suggested, the

limitations of these dependent claims, when viewed through or in combination with the limitations of the respective independent claims, are also not identically taught or suggested.

For at least the foregoing reasons, the Applicants submit that claims 2, 3, 22, and 23 are not unpatentable under 35 U.S.C. § 103 over the cited references, and that the rejections under 35 U.S.C. § 103 are thus improper. The Applicants therefore respectfully request reconsideration and withdrawal of the rejections of claims 2, 3, 22, and 23 under 35 U.S.C. § 103.

On page 7 of the Office Action, the Examiner rejects claims 7 and 27 under 35 U.S.C. § 103 as being unpatentable over Atashroo and Tufvesson in view of “A State Of The Art SIMD Two-Dimensional FFT Array Processor” by Yasrebi et al. (hereafter Yasrebi). The Applicants respectfully traverse these rejections for at least the following reasons.

Applicants maintain that the Examiner has failed to make a *prima facie* case of obviousness under 35 U.S.C. § 103(a). As discussed above, for a valid *prima facie* case of obviousness under 35 U.S.C. § 103(a), the prior art references when combined must teach or suggest all the claim limitations." The initial burden is on the Examiner to establish a *prima facie* case of obviousness under 35 U.S.C. § 103(a).

Regarding the Examiner's rejection of dependent claims 7 and 27, for at least the reasons that these claims are dependent from respective independent claims whose limitations are not identically taught or suggested, the limitations of

these dependent claims, when viewed through or in combination with the limitations of the respective independent claims, are also not identically taught or suggested.

In the Office Action, the Examiner concedes that “Atashroo does not teach that said correlation pixel values being obtained from a multiplication lookup table . . . .” Applicants concur. The Examiner then points to page 22 of Yasrebi to purportedly remedy these deficiencies in Atashroo. Applicants traverse.

The Examiner quotes the Yasrebi reference stating that “the results on the different moduli can be stored in look-up tables.” Applicants submit that their claimed “pixel values” are entirely different than the “moduli” mentioned in Yasrebi. The Examiner also states that using lookup tables “is extremely well known in the field of computer programming.” Applicants respectfully submit that if lookup tables have been known in the corresponding art for quite some time, then their unique solution of utilizing a “*multiplication lookup table*” to efficiently perform their claimed “*multiplication procedure*” indicates the clear existence of secondary indicia of non-obviousness. For example, there apparently has been a long-felt need for Applicants’ solution in the relevant technological field. Furthermore, other entities and individuals in analogous arts have apparently failed to successfully overcome the foregoing problems in the manner disclosed by Applicants.

For at least the foregoing reasons, the Applicants submit that claims 7 and 27 are not unpatentable under 35 U.S.C. § 103 over the cited references, and that the rejections under 35 U.S.C. § 103 are thus improper. The Applicants therefore

respectfully request reconsideration and withdrawal of the rejections of claims 7 and 27 under 35 U.S.C. § 103.

On page 9 of the Office Action, the Examiner rejects claims 4, 10, 11, 13-16, 24, 30, 31, and 33-36 under 35 U.S.C. § 103 as being unpatentable over Atashroo and Tufvesson in view of “Quad-Phase-Only Filter Implementation” by Hansche et al. (hereafter Hansche). The Applicants respectfully traverse these rejections for at least the following reasons.

Applicants maintain that the Examiner has failed to make a *prima facie* case of obviousness under 35 U.S.C. § 103(a). As discussed above, for a valid *prima facie* case of obviousness under 35 U.S.C. § 103(a), the prior art references when combined must teach or suggest all the claim limitations." The initial burden is on the Examiner to establish a *prima facie* case of obviousness under 35 U.S.C. § 103(a).

Regarding the Examiner’s rejection of dependent claims 4, 10, 11, 13-16, 24, 30, 31, and 33-36, for at least the reasons that these claims are dependent from respective independent claims whose limitations are not identically taught or suggested, the limitations of these dependent claims, when viewed through or in combination with the limitations of the respective independent claims, are also not identically taught or suggested.

With further regard to the rejections of claims 4 and 24, the Examiner concedes that “the combination of Atashroo and Tufvesson does not teach a first binarization step. . . .” Applicants concur. The Examiner then points to column



1 of Hansche to purportedly remedy these deficiencies. Applicants respectfully traverse. The Examiner cites an equation 1 of the Hansche reference against Applicants' claimed limitations regarding the "*first binarization step*" that substitutes a "decimal value of "1" or "a decimal value of "-1" for certain complex coefficients. Applicants submit that the cited equation 1 from Hansche nowhere discloses any sort of substitution technique that is part of a "first binarization step," as claimed by Applicants. For at least these reasons, Applicants therefore request reconsideration and withdrawal of the rejections of claims 4 and 24.

With respect to the rejections of claim 11 and 31, Applicants submit that none of the cited references teach a "*symmetrical reduction procedure*" that is performed "*upon said binarized reference image*" (emphasis added), as claimed by Applicants. Furthermore, Atashroo teaches reducing the size of the image array as an integrated part of the two-step FFT process (see column 4, lines 45-64). In contrast, Applicants disclose and claim a "*discrete symmetrical reduction procedure*" (emphasis added) that is performed as a distinct and separate step, as recited in claims 11 and 31.

In the Office Action, the Examiner cites the same arguments made with respect to the rejections of claims 4 and 24 against Applicants claimed "two-step binarization procedure" as recited in claims 10, 13, 30, and 33. Applicants therefore incorporate by reference their foregoing arguments made above with respect to claims 4 and 24. In particular, Applicants submit that none of the cited references discloses a "two-step binarization procedure."

For at least the foregoing reasons, the Applicants submit that claims 4, 10, 11, 13-16, 24, 30, 31, and 33-36 are not unpatentable under 35 U.S.C. § 103 over the cited references, and that the rejections under 35 U.S.C. § 103 are thus improper. The Applicants therefore respectfully request reconsideration and withdrawal of the rejections of claims 4, 10, 11, 13-16, 24, 30, 31, and 33-36 under 35 U.S.C. § 103.

On page 12 of the Office Action, the Examiner rejects claims 5 and 25 under 35 U.S.C. §103 as being unpatentable over Atashroo and Tufvesson in view of U.S. Patent No. 4,402,075 to Bargeton et al. (hereafter Bargeton). The Applicants respectfully traverse these rejections for at least the following reasons.

Applicants maintain that the Examiner has failed to make a *prima facie* case of obviousness under 35 U.S.C. § 103(a). As discussed above, for a valid *prima facie* case of obviousness under 35 U.S.C. § 103(a), the prior art references when combined must teach or suggest all the claim limitations." The initial burden is on the Examiner to establish a *prima facie* case of obviousness under 35 U.S.C. § 103(a).

Regarding the Examiner's rejection of dependent claims 5 and 25, for at least the reasons that these claims are dependent from respective independent claims whose limitations are not identically taught or suggested, the limitations of these dependent claims, when viewed through or in combination with the limitations of the respective independent claims, are also not identically taught or suggested.

In the rejections of claims 5 and 25, the Examiner concedes that Atashroo, Tufvesson, and Hansche fail to “explicitly teach a second binarization step . . . .” Applicants concur. The Examiner then cites column 10, line 41, of Bargeton to purportedly remedy these deficiencies. Applicants respectfully traverse. Applicants submit that the cited section of Bargeton nowhere discloses the specific binarization details recited by Applicants in claims 5 and 25. Furthermore, Applicants submit that none of the cited references teach “*said stored binarization values subsequently being converted into said initial binarization values for performing any required mathematical calculations,*” as claimed by Applicants.

For at least the foregoing reasons, the Applicants submit that claims 5 and 25 are not unpatentable under 35 U.S.C. § 103 over the cited references, and that the rejections under 35 U.S.C. § 103 are thus improper. The Applicants therefore respectfully request reconsideration and withdrawal of the rejections of claims 5 and 25 under 35 U.S.C. § 103.

On page 14 of the Office Action, the Examiner rejects claims 17, 18, 37, and 38 under 35 U.S.C. § 103 as being unpatentable over Atashroo and Tufvesson in view of Hansche and Yasrebi. The Applicants respectfully traverse these rejections for at least the following reasons.

Applicants maintain that the Examiner has failed to make a *prima facie* case of obviousness under 35 U.S.C. § 103(a). As discussed above, for a valid *prima facie* case of obviousness under 35 U.S.C. § 103(a), the prior

art references when combined must teach or suggest all the claim limitations." The initial burden is on the Examiner to establish a *prima facie* case of obviousness under 35 U.S.C. § 103(a).

Regarding the Examiner's rejection of dependent claims 17, 18, 37, and 38, for at least the reasons that these claims are dependent from respective independent claims whose limitations are not identically taught or suggested, the limitations of these dependent claims, when viewed through or in combination with the limitations of the respective independent claims, are also not identically taught or suggested.

For at least the foregoing reasons, the Applicants submit that claims 17, 18, 37, and 38 are not unpatentable under 35 U.S.C. § 103 over the cited references, and that the rejections under 35 U.S.C. § 103 are thus improper. The Applicants therefore respectfully request reconsideration and withdrawal of the rejections of claims 17, 18, 37, and 38 under 35 U.S.C. § 103.

On page 15 of the Office Action, the Examiner rejects claims 8 and 28 under 35 U.S.C. §103 as being unpatentable over Atashroo and Tufvesson in view of Yasrebi and Hansche. The Applicants respectfully traverse these rejections for at least the following reasons.

Applicants maintain that the Examiner has failed to make a *prima facie* case of obviousness under 35 U.S.C. § 103(a). As discussed above, for a valid *prima facie* case of obviousness under 35 U.S.C. § 103(a), the prior art references when combined must teach or suggest all the claim

limitations." The initial burden is on the Examiner to establish a *prima facie* case of obviousness under 35 U.S.C. § 103(a).

Regarding the Examiner's rejection of dependent claims 8 and 28, for at least the reasons that these claims are dependent from respective independent claims whose limitations are not identically taught or suggested, the limitations of these dependent claims, when viewed through or in combination with the limitations of the respective independent claims, are also not identically taught or suggested.

With further regard to the rejections of claim 8 and 28, the Examiner states that "Hansche teaches constraining each of the transform arrays to 4 possible phase values . . . , as suggested by equation 1." Applicants find no such teaching in equation 1 of Hansche, and respectfully request the Examiner to provide specific explanations of this assertion.

Furthermore, the Examiner concedes that "the combination does not describe an actual combination commensurate with the requirements of claim 8." Applicants concur. Then, without providing any further references to support these rejections, the Examiner concludes that "the combination would have been obvious." The Examiner is apparently utilizing Official Notice without expressly stating so.

Applicants submit that the particular combination of claimed limitations would not be obvious to one skilled in the art at the time of the invention. Applicants further submit that the Examiner has improperly utilized Official Notice because the cited limitations are uniquely utilized by the Applicants to

produce novel combinations that are not well-known or predictable. Applicants therefore respectfully request the Examiner to cite specific references in support of these rejections, and failing to do so, to reconsider and withdraw the rejections of claims 8 and 28, so that the present Application may issue in a timely manner.

For at least the foregoing reasons, the Applicants submit that claims 8 and 28 are not unpatentable under 35 U.S.C. § 103 over the cited references, and that the rejections under 35 U.S.C. § 103 are thus improper. The Applicants therefore respectfully request reconsideration and withdrawal of the rejections of claims 8 and 28 under 35 U.S.C. § 103.

On page 17 of the Office Action, the Examiner rejects claims 19, 20, 39, 40, and 43 under 35 U.S.C. § 103 as being unpatentable over Atashroo, Tufvesson, Hansche, Yasrebi, and Bhagavatula in view of “Continuous & Discrete Signal & System Analysis,” by McGillem et al. (hereafter McGillem). The Applicants respectfully traverse these rejections for at least the following reasons.

Applicants maintain that the Examiner has failed to make a *prima facie* case of obviousness under 35 U.S.C. § 103(a). As discussed above, for a valid *prima facie* case of obviousness under 35 U.S.C. § 103(a), the prior art references when combined must teach or suggest all the claim limitations." The initial burden is on the Examiner to establish a *prima facie* case of obviousness under 35 U.S.C. § 103(a).

Regarding the Examiner's rejection of dependent claims 19, 20, 39, 40, for at least the reasons that these claims are dependent from respective independent

claims whose limitations are not identically taught or suggested, the limitations of these dependent claims, when viewed through or in combination with the limitations of the respective independent claims, are also not identically taught or suggested.

With further regard to the rejections of claims 19 and 38, the Examiner cites page 11, paragraph 121 of Bhagavatula against Applicants' claimed "FFT shift procedure to generate a correlation graph." Applicants respectfully traverse. In particular, Applicants submit that paragraph 121 of Bhagavatula nowhere teaches an "*FFT shift procedure*" (emphasis added), as claimed by Applicants. Furthermore, Applicants submit that paragraph 121 of Bhagavatula nowhere teaches a shift procedure "*to generate a correlation graph,*" as recited by Applicants.

In the Office Action, the Examiner concedes that the combination of cited references "does not explicitly teach performing an FFT shift procedure." Applicants concur. The Examiner then points to page 142 of McGillem to purportedly remedy these deficiencies. Applicants traverse. Page 142 of McGillem discusses a "delayed pulse signal," which is not analogous to Applicants' invention. Furthermore, Applicants submit that none of the cited references teach "*discarding imaginary values,*" as claimed by Applicants. For at least the foregoing reasons, Applicants therefore request the Examiner to reconsider and withdraw the rejections of claims 19 and 39.

With regard to the rejection of claim 43, the Examiner cites the same arguments made with respect to the rejections of claims 4 and 5 against

Applicants claimed “binarization procedure” as recited in claim 43.

Applicants therefore incorporate by reference their foregoing arguments made above with respect to claims 4 and 5. In particular, Applicants submit that none of the cited references discloses a “binarization procedure.”

For at least the foregoing reasons, the Applicants submit that claims 19, 20, 39, 40, and 43 not unpatentable under 35 U.S.C. § 103 over the cited references, and that the rejections under 35 U.S.C. § 103 are thus improper. The Applicants therefore respectfully request reconsideration and withdrawal of the rejections of claims 19, 20, 39, 40, and 43 under 35 U.S.C. § 103.



### Summary

Applicants submit that the foregoing amendments and remarks overcome the Examiner's rejections under 35 U.S.C. §103(a). Because the cited references, or the Examiner's citations thereto, do not teach or suggest the claimed invention, and in light of the differences between the claimed invention and the cited prior art, Applicants therefore submit that the claimed invention is patentable over the cited art, and respectfully request the Examiner to allow claims 1-44, so that the present Application may issue in a timely manner. If there are any questions concerning this Response, the Examiner is invited to contact the Applicants' undersigned representative at the number provided below.

Respectfully submitted,

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